

RE-POWERING AMERICA’S LAND INITIATIVE: Renewable Energy Projects on Potentially Contaminated Lands, Landfills, and Mine Sites

Through the RE-Powering America’s Land initiative, the U.S. Environmental Protection Agency promotes the reuse of potentially contaminated lands and landfills for renewable energy through a combination of tailored redevelopment tools for communities and developers, as well as site-specific technical support. The initiative aims to revitalize degraded land by promoting renewable energy as a productive end use, when aligned with the community vision for the site. RE-Powering aims to turn liabilities into assets for surrounding communities by fostering collaborative networks between the energy and remediation sectors.

This list tracks completed projects where renewable energy systems have been installed on contaminated lands, landfills, and mine sites. Projects on this list include ground-mounted utility-scale systems, roof-top systems, and systems used for onsite power, including to power the cleanup activities. Summary statistics of the known installations are provided below. This resource is for informational purposes only. The information in this list was gathered from public announcements of renewable energy projects in the form of company press releases, news releases, and, in some cases, conversations with the parties involved. It may not be a comprehensive list of all projects completed on contaminated land. To provide information on additional projects, please email cleanenergy@epa.gov.

Overview

Total number of sites	60	Max system size (MW)	35.0
Total installed capacity (MW)	184.7	Min system size (kW)	0.2
Total # states represented	25	Avg system size (MW)	4.0

Opportunities for Many Renewable Energy Technologies

While a range of renewable energy technologies are compatible with conditions at contaminated sites and landfills, solar PV is the predominate technology currently installed on contaminated lands. Several large-scale wind farms represent a significant portion of the RE-Powering style projects.

Installations by Renewable Technology

	# Sites	Installed Capacity (MW)
Solar PV	49	108.94
Wind	7	55.71
Biomass	1	20.00
Hydro	1	0.03
Solar PV; Wind	1	0.00
Geothermal	1	0.00
	60	184.68

Liabilities into Assets

The RE-Powering strategy creates new markets for potentially contaminated lands, while providing a sustainable land development strategy for renewable energy. For installations recorded to date, both private and public lands are being remediated and reused to build new renewable energy infrastructure.

Installations by Site Ownership Type

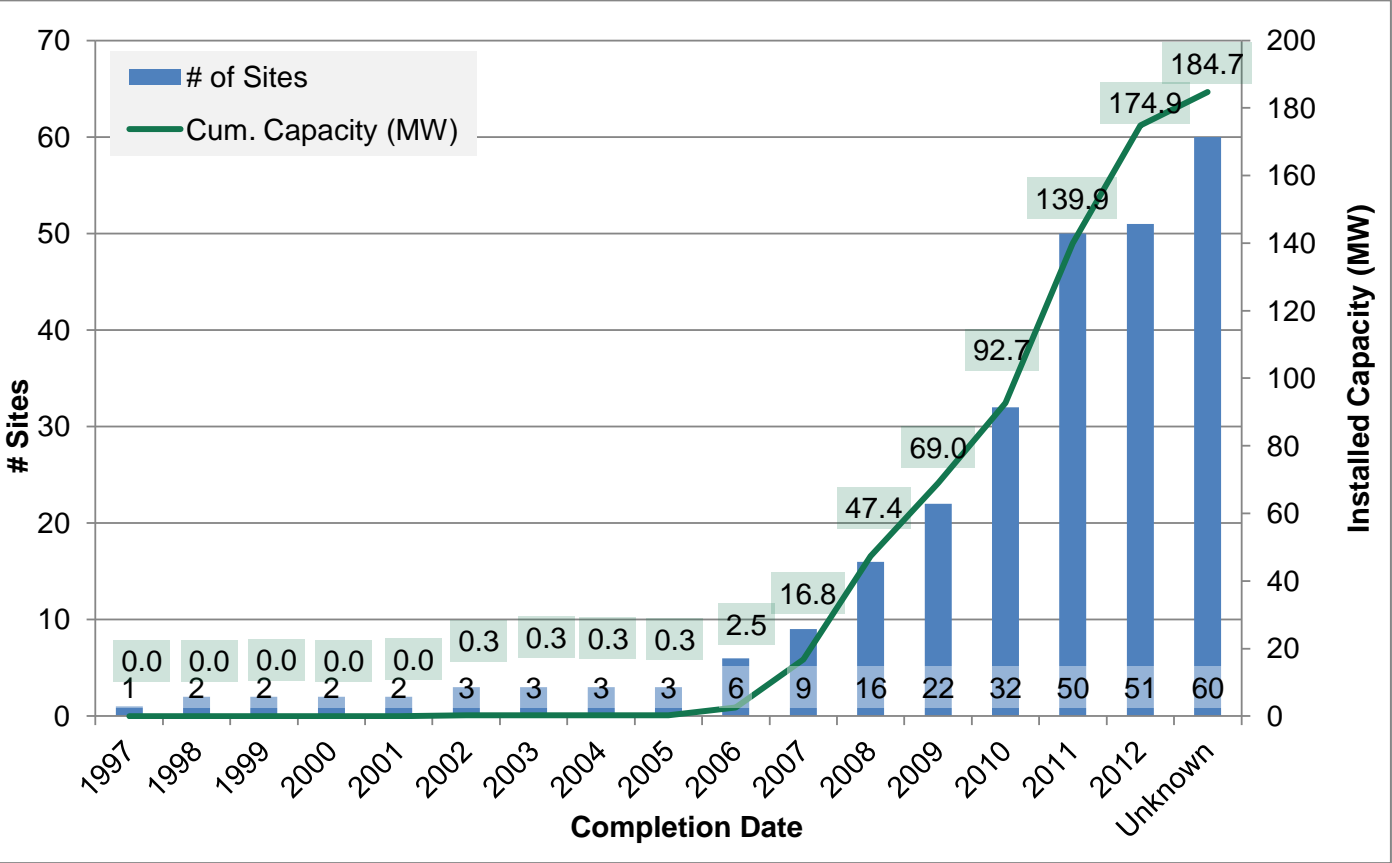
Ownership type	# Sites	Installed Capacity (MW)
Private	24	76.0
Federal	10	71.8
Municipal	12	22.3
Other	8	13.7
State	2	0.9
Unknown	4	0.0
	60	184.7

Proving low-cost, clean power to communities

Based on current trends, the majority of the RE-Powering energy systems sell power back to the grid as wholesale electricity, while a subset provide energy for onsite use. Systems range from large-scale utility plants, like the 35-MW Steel Winds project, to small-scale green remediation systems, like the 68-kW Frontier Fertilizer PV system.

Installations by Energy Production

EPA / Other Program	# Sites	Installed Capacity (MW)
Wholesale Electricity	25	129.6
Onsite Use - General	10	41.7
Unknown	6	6.2
Rooftop	4	4.7
Green Remediation	15	2.5
	60	184.7



Growing Trend: Revitalizing Contaminated Lands with Renewable Energy

When RE-Powering launched in 2008, only 16 projects with total capacity of 47 MW, including small-scale remediation systems, were installed on contaminated sites. In less than four years, RE-Powering tracked a compound annual growth rate of 40%. While the proportion of renewable energy projects on contaminated lands is relatively small, RE-Powering is seeing a marked trend, showing that this land development strategy is gaining momentum.

(1) All tables sorted by installed capacity.
(2) Capacities for some systems are unknown. These projects are included in total count, but recorded as zero capacity.

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Significant Land Development Opportunities

RE-Powering seizes the opportunity to address contamination and support renewable energy implementation to achieve economic and environmental benefits that come with it. Installations to date demonstrate the viability of projects across all EPA and state remediation programs, from powering RCRA operating facilities and Federal Facilities to repurposing brownfield and Superfund sites.

Installations by EPA Program

	# Sites	Installed Capacity (MW)
RCRA	10	70.4
Federal Facility	8	57.3
Brownfields	19	29.9
Landfill	10	11.7
Superfund	8	7.1
Unknown	3	5.3
Landfill Buffer	1	3.0
Superfund Removal	1	0.0
	60	184.7

National Deployment

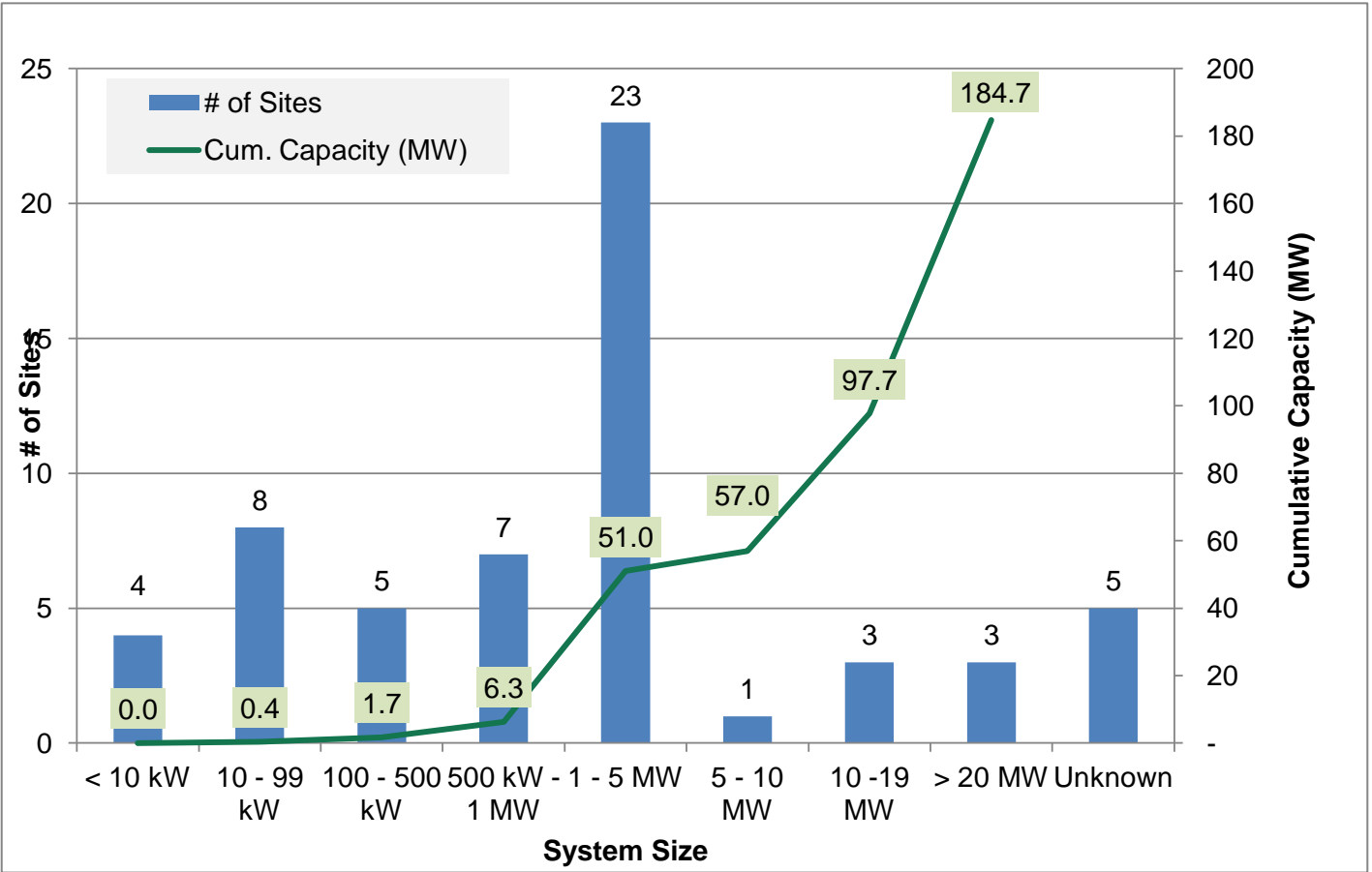
RE-Powering has identified installations of renewable energy on contaminated land, landfills, and mine sites in 25 states. The locations of these installations reflect the evolving market trends, generally linked to available renewable energy resource, Renewable Portfolio Standards, net-metering laws, and other incentives.

Installations by State

State	# Sites	Installed Capacity (MW)
NY	6	67.2
SC	1	20.0
WY	1	16.5
MA	11	15.6
NJ	7	14.7
NV	1	14.2
CA	8	12.1
IL	2	10.9
CO	4	5.4
PA	1	3.0
RoUS	18	5.0
	60	184.7

Solar PV Installations by State

State	# Sites	Installed Capacity (MW)
NY	4	32.2
NJ	7	14.7
NV	1	14.2
MA	9	12.3
CA	8	12.1
IL	1	10.0
CO	3	5.4
PA	1	3.0
HI	1	1.2
GA	1	1.0
RoUS	12	2.8
	48	108.9



Range of Project Sizes

RE-Powering promotes renewable energy as a viable end use for contaminated lands, landfills, and mine sites. The range in project size reflects market conditions and trends, available acreage, electricity demands, and . While large-scale systems (1-10 MW) make up 40% of the total number of installed RE-Powering projects, utility-scale systems (10+ MW) comprise 70% of the total installed capacity on contaminated lands.

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Site/Project Name	EPA Region	State	City	EPA Program / Other Program	Site Owner	Site Ownership Type	Property Acreage	Former Use Description	RE Type	Project Capacity (MW)	Project Acreage	Primary RE Developer Name	Completion Date	Project Type
Apache Powder	9	AZ	Benson	Superfund	Apache Nitrogen Products, Inc.	Private	1,100	Dynamite Manufacturing Facility	Solar PV	0.00			1997	Onsite Use - Green Remediation
Aerojet General Corporation Superfund Site	9	CA	Sacramento	Superfund	Aerojet	Private	5,900	Rocket Propulsion development and testing facility	Solar PV	6.00	40.0	Solar Power, Inc.	2010	Wholesale Electricity
Fischer Properties: Depot Park	9	CA	Sacramento	Unknown	Fischer Properties	Private			Solar PV	3.00	15.0	SPG Solar	2010	Onsite Use - General
Camp Pendleton Landfill	9	CA	Camp Pendleton	Federal Facility	U.S. Marine Corps	Federal		Landfill	Solar PV	1.50		Kyocera Solar	2011	Onsite Use - General
West County Wastewater District	9	CA	Richmond	Brownfields	West County Wastewater District	Municipal		Sludge-drying pond	Solar PV	1.00	10.0	Solar Power Partners, Inc.	2008	Onsite Use - General
NASA Jet Propulsion Laboratory (JPL)	9	CA	Pasadena	Federal Facility	NASA	Federal			Solar PV	0.56			2011	Rooftop
Frontier Fertilizer	9	CA	Davis	Superfund	Frontier Fertilizer	Private	18	Fertilizer and pesticide storage, sales and application	Solar PV	0.07	0.5		2011	Onsite Use - Green Remediation
Pemaco Superfund Site	9	CA	Maywood	Superfund	City of Maywood	Municipal	1	Custom Chemical Blender	Solar PV	0.01	1.4		2007	Onsite Use - Green Remediation
Lawrence Livermore National Laboratory	9	CA	Livermore	Superfund	U.S. DOE	Federal	7,000	Ranchland, weapons testing range	Solar PV	0.00			2009	Onsite Use - Green Remediation
Fort Carson	8	CO	Fort Carson	Landfill	U.S. Army	Federal	15	Former Landfill	Solar PV	2.00	12.0	Colorado Springs Utilities	2008	Wholesale Electricity
Belmar Mixed-Use Development	8	CO	Lakewood	Brownfields	Mixed Private/Public	Other	48	Shopping mall	Solar PV	1.70	47.5	SunPower Corporation	2008	Rooftop
New Rifle Mill	8	CO	Rifle	Federal Facility	City of Rifle	Municipal	130	Uranium Mill	Solar PV	1.70	12.0	SunEdison	2009	Onsite Use - General
Summitville Mine Superfund Site	8	CO	Del Norte	Superfund	U.S. Forest Service	Federal	1,400	Heap leach gold and silver mining	Hydro	0.03			2011	Onsite Use - Green Remediation
Bee Ridge Landfill / Rothenbach Park	4	FL	Sarasota	Landfill	Sarasota County	Other		Landfill	Solar PV	0.25		Florida Power & Light	2008	Wholesale Electricity
Hickory Ridge Landfill	4	GA	Atlanta	RCRA	Republic Services, Inc	Private	48	Landfill	Solar PV	1.00	10.0	Republic Services	2011	Wholesale Electricity
Kapolei Sustainable Energy Park	9	HI	Kapolei	RCRA	James Campbell Company LLC	Private	12	Former Industrial Waste Site	Solar PV	1.20	4.0	Forest City Hawaii	2011	Wholesale Electricity

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Exelon City Solar	5	IL	Chicago	Brownfields	City of Chicago	Municipal	21	Foundry and casting operation/fastener, hydraulic system components, and ball bearing manufacturer	Solar PV	10.00	41.0	Exelon and SunPower Corporation	2010	Wholesale Electricity
Gobnob Wind Turbine Project	5	IL	Farmersville	Brownfields	Illinois DNR	State	14	Freeman United Crown 1 Mine	Wind	0.90		Rural Electric Convenience Cooperative (RECC) of central Illinois	2009	Wholesale Electricity
Indian Orchard Solar Facility	1	MA	Springfield	Brownfields	Springfield Redevelopment Authority	Other		Former Foundry	Solar PV	2.30	12.0	Western Massachusetts Electric Company	2011	Wholesale Electricity
Oliver Street Landfill	1	MA	Easthampton	Unknown	City of Easthampton	Municipal	40	MSW landfill	Solar PV	2.30	11.0	Borrego Solar		Unknown
Pittsfield Municipal Landfill	1	MA	Lunenburg	RCRA	Town of Lunenburg	Municipal		Landfill	Solar PV	1.83			2011	Unknown
Silver Lake Solar Photovoltaic Facility	1	MA	Pittsfield	Brownfields	Western Massachusetts Electric Company (WMECO)	Other	8	Former GE site and former steam generating site	Solar PV	1.80	8.0	Western Massachusetts Electric Company (WMECO)	2010	Wholesale Electricity
Hull Wind II	1	MA	Hull	Landfill	HMLP	Other		Landfill	Wind	1.80		Hull Municipal Power and Light (HMPL)	2006	Wholesale Electricity
AFCEE: Massachusetts Military Reservation	1	MA	Sagamore	Federal Facility	U.S. Air Force	Federal	22,000	Military training and aircraft operation and maintenance involved hazardous materials such as explosives, fuels, and cleaning solvents that were released to the environment	Wind	1.50			2011	Onsite Use - Green Remediation
Dorchester Solar Power Project	1	MA	Dorchester	Brownfields	National Grid	Private		Former Manufactured Gas Plant	Solar PV	1.30	6.0			Unknown
Haverhill Solar Power Project	1	MA	Haverhill	Brownfields	National Grid	Private		Former Manufactured Gas Plant	Solar PV	1.00	5.0	Rivermoor Energy	2010	Wholesale Electricity
Revere Solar Power Project	1	MA	Revere	Brownfields	National Grid	Private		Former Manufactured Gas Plant	Solar PV	0.75	3.0		2010	Wholesale Electricity

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Everett Solar Power Project	1	MA	Everett	Brownfields	National Grid	Private		Former Manufactured Gas Plant	Solar PV	0.61	2.5		2010	Wholesale Electricity
Brockton Brightfield	1	MA	Brockton	Brownfields	City of Brockton and Bay State Gas Company	Municipal	27	Former Gas Works Site	Solar PV	0.46	3.7	Global Solar	2006	Wholesale Electricity
Former Ellicott City Landfill	3	MD	Ellicott City	Landfill	Howard County	Municipal	83	Landfill	Solar PV	-	2.0		2011	Onsite Use - General
Busy Bee's Laundry	7	MO	Rolla	Brownfields		Private		Dry Cleaner	Solar PV	0.56			2011	Onsite Use - Green Remediation
Evergreen Packaging Landfill	4	NC	Haywood County	Landfill	Evergreen Packaging	Private		Landfill	Solar PV	0.55	3.0	FLS Energy	2010	Wholesale Electricity
NC State University - Agricultural Pesticide Landfill	4	NC	Raleigh	Brownfields	NC State University	Private		Landfill	Solar PV	0.08		Carolina Solar Energy	2007	Wholesale Electricity
Former Nebraska Ordnance Plant	7	NE	Mead	Federal Facility		Unknown		Ordnance Plant	Wind	0.01				Onsite Use - Green Remediation
Edgeboro Landfill	2	NJ	East Brunswick	Landfill	Middlesex County	Municipal		Landfill	Solar PV	4.30	27.0	NREC Solar		Wholesale Electricity
Linden Solar Farm	2	NJ	Linden	Brownfields	Public Service Electric and Gas Company (PSE&G)	Other			Solar PV	3.20	10.0	Advanced Solar Products	2011	Wholesale Electricity
Pennsauken Landfill Renewable Energy Park-Solar	2	NJ	Pennsauken	Landfill	Pollution Control Financing Authority of Camden County	Other	39	Landfill	Solar PV	2.60	10.0	PPL Renewable Energy	2008	Wholesale Electricity
FedEx Ground Distribution Hub	2	NJ	Woodbridge	Brownfields	FedEx	Private	200	Former chemical facility	Solar PV	2.42	3.3	BP Solar	2009	Rooftop
Trenton Solar Farm	2	NJ	Trenton	Brownfields	PSE&G	Private		PSE&G-owned brownfield property	Solar PV	1.30	5.5	PSE&G		Wholesale Electricity
Rothenbach Park	2	NJ	Fairhaven	RCRA	Town of Fairhaven	Municipal		MSW landfill	Solar PV	0.58	3.0	Blue Sky Power		Unknown
Paulsboro Terminal Landfill	2	NJ	Paulsboro	Brownfields	BP	Private	17	Former refined petroleum and specialty chemical bulk storage and distribution facility	Solar PV	0.28	5.0	BP	2002	Onsite Use - Green Remediation

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Chevron Questa Project	6	NM	Questa	Superfund	Chevron Mining	Private		Mining Site	Solar PV	1.00	20.0	Chevron Technology Venture	2011	Wholesale Electricity
Nellis AFB Solar Facility Site	9	NV	Las Vegas	RCRA	U.S. Government	Federal	14,000	33 Acres of solar facility are a former landfill	Solar PV	14.20	140.0	MMA Renewable Ventures LLC,	2007	Onsite Use - General
Bethlehem Steel Winds Project	2	NY	Lackawanna	RCRA	Tecumseh Redevelopment Inc	Private	1,600	Steel Mill	Wind	35.00	30.0	BQ Energy and First Wind	2012	Wholesale Electricity
Long Island Solar Farm at Brookhaven National Laboratory	2	NY	Upton	Federal Facility	Brookhaven National Lab	Federal		Previously disturbed land at DOE National Laboratory Facility	Solar PV	32.00	200.0	Long Island Solar Farm, LLC (BP Solar and MetLife)	2011	Wholesale Electricity
Islip Municipal Town Landfill	2	NY	Hauppauge	RCRA	Town of Islip	Municipal	55	MSW landfill	Solar PV	0.05		Town of Islip	2011	Unknown
Madison County Agriculture and Renewable Energy Park	2	NY	Lincoln	Landfill	Madison County	Municipal	600	MSW Landfill	Solar PV	0.05	1.0	Carlisle Energy Services, Inc.	2011	Onsite Use - General
Tech City	2	NY	Ulster	RCRA	Tech City	Private	256	Computer mainframe development and testing facility	Solar PV	0.05		Solartech Renewables Inc.	2011	Rooftop
Former Ferdula Landfill	2	NY	Frankfurt	Landfill		Unknown	2	Landfill	Wind	-			1998	Onsite Use - Green Remediation
Pilkington North America	5	OH	Northwood	Brownfields	Pilkington North America, Inc.	Private	11	Glass Manufacturing Facility	Solar PV	0.25	1.0	Hull & Associates	2011	Onsite Use - General
Dayton Tech Town	5	OH	Dayton	Unknown		Unknown			Geothermal	-		Heapy Engineering	2010	Onsite Use - General
Altus Air Force Base	6	OK	Altus	Federal Facility	Air Force	Federal			Solar PV	0.00				Onsite Use - Green Remediation
Exelon-Conergy Solar Energy Center	3	PA	Falls Township	Landfill Buffer	Waste Management of Pennsylvania	Private	17	Buffer property adjacent to Geological Reclamation Operations and Waste Systems (GROWS) municipal waste landfill	Solar PV	3.00	16.5	Conergy Company	2008	Wholesale Electricity
Savannah River's Biomass Steam Plant	4	SC	Aiken	Federal Facility	DOE	Federal	34	1950s vintage coal-fired steam plant	Biomass	20.00	34.0	Ameresco Inc	2008	Onsite Use - General

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Tessman Road Municipal Solid Waste Landfill	6	TX	San Antonio	Landfill	Republic Services, Inc	Private	680	MSW Landfill	Solar PV	0.13	5.6	CSP Energy	2009	Unknown
Grove Landfill	6	TX	Austin	Brownfields	Rhizome Collective, Inc	Other	10		Solar PV	-				Onsite Use - Green Remediation
Crozet Orchard	3	VA	Crozet	Superfund Removal		Private		Apple Orchard	Solar PV	-				Onsite Use - Green Remediation
Former St. Croix Alumina Plant	2	VI	St Croix	RCRA		Unknown		Alumina Plant	Solar PV; Wind	0.00			2006	Onsite Use - Green Remediation
Refuse Hideaway Landfill	5	WI	Middleton	Superfund	State of Wisconsin	State	23	Landfill	Solar PV	0.01	0.1	Full Spectrum Solar Company	2010	Onsite Use - Green Remediation
Chevron Casper Wind Farm	8	WY	Casper	RCRA	Chevron	Private	880	Refinery	Wind	16.50	880.0	Chevron Global Power Company	2009	Wholesale Electricity